UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,303	02/28/2002	William L. Bowden	08935-257001	7607

26161 7590 03/03/2006

FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
ALEJANDRO, RAYMOND	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 03/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED
MAR 0 3 2006
GROUP 1700

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/085,303
Filing Date: February 28, 2002
Appellant(s): BOWDEN ET AL.

Fish & Richardson P.C.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 02/06/06 appealing from the Office action mailed 08/04/05.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient because it states that a special controlled process including certain specific techniques must be used to manufacture the cell (See Appeal Brief at page 7-8). In addition to that, appellant has asserted that the declaration under 37 CFR 1.132 of Michael Pozin dated 12/01/04 (re-submitted on 02/06/06) (See Appeal Brief at page 8) explains the significance of the special controlled process. Note that the present claims neither claim a method of manufacturing/making the lithium electrochemical cell nor contain product-by-process limitations to further set forth any process/step recitation (i.e. a product claim that defines the claimed product in terms of the process by which it is made). As such, the summary of claimed subject matter by the appellant contains subject matter which is not present in the appealed claims. Appellant's summary of claimed subject matter is not commensurate in scope with the present claims. Appellant is

advised that the summary of the claimed subject matter should be limited to that which is claimed.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

(A) Listing of Prior Art References

5,554,462	FLANDROIS et al	09-1996
2003/0186110	SLOOP	10-2003
2004/0005267	BORYTA et al	01-2004
2001/0028871	HARRISON et al	10-2001

(B) Brief Description of Prior Art References

Flandrois et al teach a lithium rechargeable electrochemical cell constituted by an organic solvent comprising the specific lithium salts and mixture of solvents. Essentially, the mixture of solvents and the salt mixture of Flandrois et al are the same mixture of solvents and salt mixture claimed by the appellant.

Sloop discloses lithium electrochemical cells having suitable or typical electrolytes containing specific lithium salts and mixture of solvents. The lithium electrochemical cells of Sloop use the specifically claimed electrolyte including both the solvents and salts.

Harrison et al disclose that it was known at the time the invention was made to employ high purity lithium metal in the emerging technology of lithium batteries because high purity lithium-based components minimize lithium's rapid reactions with substances such as sodium

which is considered an impurity. In particular, Harrison et al disclose the production of lithium-based components such as lithium metal being ultra-pure having maximum impurities levels of 100 ppm Na (sodium) or 190 ppm Na (sodium). Harrison et al clearly expressed that impurities such as sodium (Na) affect the purity of lithium metal, thereby they are deleterious for the operation of electrochemical cells; and also affect the performance of the electrochemical cell or adversely affect the current efficiency of lithium cells.

Boryta et al suggest that those of ordinary skill in the art at the time the invention was made knew that it is desirable to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical environments, especially those using lithium metals. In essence, Boryta et al suggest that it was known to manufacture low sodium lithium metal suitable for battery applications, specifically, battery grade lithium metal containing less than 100 ppm sodium.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sloop US 2003/0186110 in view of Harrison et al 2001/0028871.

<u>As for claims 1-5:</u>

Sloop makes known lithium batteries having suitable or typical electrolytes containing lithium salts dissolved in a carbonate solvent or <u>solvent mixture</u> (SECTION 0026). Examples of lithium salts include LiTFSI and LiTFS (lithium trifluoromethanesulfonate) dissolved in solvents such as DME (dimethoxyethane) and propylene carbonate (SECTION 0026).

It is noted that in the absence of any electrochemical cell component/feature derived from and/or containing sodium (Na), the electrochemical cell may exhibit zero content of sodium (Na), that is to say, no sodium (Na) content at all. Thus, if both the active materials as well as suitable salts are selected from any material and/or salt except sodium (Na), the sodium (Na) content in the cell may be reduced to the claimed sodium content.

<u>As to claims 6-7:</u>

Sloop further teaches a lithium salt concentration of 1.2 M in a 1:1 solvent mixture. The 1:1 ratio is equivalent to 50 % by weight of each solvent (SECTION 0026). In this respect, it is noted that Sloop immediately envisages how to prepare specific solvent mixtures by using any combination of the examples of solvents for the lithium salt. Thus, Sloop teaches the specific

solvent mixture (i.e. the weight content) with sufficient specificity and applicable to any possible permutations of mixed solvents.

Sloop discloses an electrochemical cell according to the foregoing aspects. However, Sloop does not expressly disclose the specific sodium content.

Harrison et al disclose methods for preparing high purity lithium carbonate which can be used to prepare battery-grade lithium metal (ABSTRACT). It is disclosed that high purity lithium carbonate is also required in the emerging technologies of lithium batteries including those using lithium ion and thin film polymer electrolyte-lithium metal (SECTION 0004). It is disclosed that high purity lithium-based components minimizes lithium's rapid reactions with such substances (SECTION 0005). *That is, such substances are impurities including Na.* In particular, Harrison et al disclose the production of lithium-based components such as lithium metal being ultra-pure having maximum impurities levels (ppm) of 100 Na or 190 Na (SECTION 0030).

Harrison et al discuss how impurities may affect the purity of lithium metal, and thus, affecting the performance of the electrochemical cell or adversely affecting the current efficiency of lithium cells (SECTION 0007); or being deleterious for the operation of the electrochemical cells (SECTION 0008). Harrison et al disclose the production of battery grade lithium metal for use in lithium ion batteries (SECTIONS 0029, 0015 & 0020).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the electrochemical cell of Sloop by having the specific sodium content of Harrison et at because Harrison et al clearly disclose that sodium impurities may affect the purity of lithium metal, and thus, affecting the performance of electrochemical cells; and/or adversely affecting the current efficiency of lithium cells; and/or being deleterious for the

operation of the electrochemical cells. Furthermore, Harrison et al directly teach the production high-purity battery grade lithium metal for use in lithium ion batteries.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flandrois et al 5554462 in view of Harrison et al 2001/0028871.

Regarding claims 1-5:

Flandrois et al reveal a lithium rechargeable electrochemical cell (ABSTRACT). It is disclosed that the electrolyte is constituted by an organic solvent comprising a mixture of esters and/or ethers such as dimethoxyethane (DME) and esters selected from propylene carbonate (PC) among others (COL 4, lines 1-13). The solvents has dissolved therein a lithium salt selected from lithium trifluoromethanesulfonate and lithium trifluoromethanesulfonimide, among others (COL 4, lines 1-14).

It is noted that in the absence of any electrochemical cell component/feature derived from and/or containing sodium (Na), the electrochemical cell may exhibit zero content of sodium (Na), that is to say, no sodium (Na) content at all. Thus, if both the active materials as well as suitable salts are selected from any material and/or salt except sodium (Na), the sodium (Na) content in the cell may be reduced to the claimed sodium content.

On the subject of claim 6:

Flandrois et al further discuss an example wherein each cell includes an electrolyte composed of an organic solvent with was a mixture of 20 % by volume of PC and also containing DME in which the lithium salt was dissolved at a concentration of 1 mole/liter (1.0 M) (EXAMPLE 9 or COL 10, lines 10-20). Since Flandrois et al directly disclose the use of

propylene carbonate (PC) within the claimed concentration/content, as well as the teaching of constituting the electrolyte by employing a mixture of esters and/or ethers such as dimethoxyethane (DME), it is thus understood that Flandrois et al implicitly shows the claimed weight percent. In this respect, it is also noted that Flandrois clearly envisages how to prepare specific solvent mixtures by using any combination of organic solvents comprising a mixture of esters and/or ethers. Thus, Flandrois teaches the specific solvent mixture (i.e. the weight content) with sufficient specificity no matter what are the specific solvents chosen from a variety of organic solvents comprising a mixture of esters and/or ethers.

Flandrois et al discloses an electrochemical cell according to the foregoing aspects. However, Flandrois et al does not expressly disclose the specific sodium content.

Harrison et al disclose methods for preparing high purity lithium carbonate which can be used to prepare battery-grade lithium metal (ABSTRACT). It is disclosed that high purity lithium carbonate is also required in the emerging technologies of lithium batteries including those using lithium ion and thin film polymer electrolyte-lithium metal (SECTION 0004). It is disclosed that high purity lithium-based components minimizes lithium's rapid reactions with such substances (SECTION 0005). That is, such substances are impurities including Na. In particular, Harrison et al disclose the production of lithium-based components such as lithium metal being ultra-pure having maximum impurities levels (ppm) of 100 Na or 190 Na (SECTION 0030).

Harrison et al discuss how impurities may affect the purity of lithium metal, and thus, affecting the performance of the electrochemical cell or adversely affecting the current efficiency of lithium cells (SECTION 0007); or being deleterious for the operation of the electrochemical

cells (SECTION 0008). Harrison et al disclose the production of battery grade lithium metal for use in lithium ion batteries (SECTIONS 0029, 0015 & 0020).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the electrochemical cell of Flandrois et al by having the specific sodium content of Harrison et at because Harrison et al clearly disclose that sodium impurities may affect the purity of lithium metal, and thus, affecting the performance of electrochemical cells; and/or adversely affecting the current efficiency of lithium cells; and/or being deleterious for the operation of the electrochemical cells. Furthermore, Harrison et al directly teach the production high-purity battery grade lithium metal for use in lithium ion batteries.

5. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sloop US 2003/0186110 in view of Boryta et al 2004/0005267.

<u>As for claims 1-5:</u>

Sloop makes known lithium batteries having suitable or typical electrolytes containing lithium salts dissolved in a carbonate solvent or <u>solvent mixture</u> (SECTION 0026). Examples of lithium salts include LiTFSI and LiTFS (lithium trifluoromethanesulfonate) dissolved in solvents such as DME (dimethoxyethane) and propylene carbonate (SECTION 0026).

It is noted that in the absence of any electrochemical cell component/feature derived from and/or containing sodium (Na), the electrochemical cell may exhibit zero content of sodium (Na), that is to say, no sodium (Na) content at all. Thus, if both the active materials as well as suitable salts are selected from any material and/or salt except sodium (Na), the sodium (Na) content in the cell may be reduced to the claimed sodium content.

<u>As to claims 6-7:</u>

Sloop further teaches a lithium salt concentration of 1.2 M in a 1:1 solvent mixture. The 1:1 ratio is equivalent to 50 % by weight of each solvent (SECTION 0026). In this respect, it is noted that Sloop immediately envisages how to prepare specific solvent mixtures by using any combination of the examples of solvents for the lithium salt. Thus, Sloop teaches the specific solvent mixture (i.e. the weight content) with sufficient specificity and applicable to any possible permutations of mixed solvents.

Sloop discloses an electrochemical cell according to the foregoing aspects. However, Sloop does not expressly disclose the specific sodium content.

Boryta et al disclose production of lithium compounds (TITLE) using integral processes for producing chemical and high purity grades of lithium materials (SECTION 0003). Boryta et al clearly divulge that it is desirable, from a commercial standpoint, to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical processes, particularly those using lithium metals (SECTION 0004); and Boryta et al further discuss about the importance of minimizing the sodium content in the metals, in particular, to manufacture low sodium lithium metal suitable for <u>battery applications</u> (SECTION 0020). Above all, Boryta et al disclose the production of battery grade lithium metal containing less than 100 ppm sodium (SECTION 0022 & 0082).

Examiner's note: it has been held that the term "about" allows for a magnitude (ppm weight) slightly above or below the claimed value, thus the ranges overlap. In re Woodruff 16 USPQ2d 1934 (See MPEP 2144.05 [R-1] Obviousness of Ranges). Thus, a prima facie case of obviousness exists as the claimed range overlaps a range disclosed by the prior art.

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the electrochemical cell of Sloop by having the specific sodium content of Boryta et al because Boryta et al clearly disclose the importance of producing high purity battery grade lithium materials because it is desirable, from a commercial standpoint, to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical processes, particularly those using lithium metals. Namely, Boryta et al directly teach the relevance of minimizing the sodium content in the metals, in particular, to manufacture low sodium lithium metal suitable for battery applications and/or battery grade lithium metal materials.

With particular respect to the cell containing between about 100 and 1500 ppm by weight of sodium, it would have been obvious to one skilled in the art at the time the invention was made to make Sloop's electrochemical cell by having the specific sodium content because Boryta et al discloses battery grade lithium metal containing less than 100 ppm sodium and it has been held that the term "about" allows for a weight slightly above or below of 100 ppm, hence, the ranges overlap. In re Woodruff 16 USPQ2d 1934 (See MPEP 2144.05 [R-1] Obviousness of Ranges). Thus, a prima facie case of obviousness exists as the claimed range overlaps the range disclosed in the prior art.

Furthermore, it would also have been obvious to a skilled artisan at the time the invention was made to make Sloop's electrochemical cell by having the claimed sodium content because even though Boryta et al's sodium content does not overlap or lie inside the claimed weight, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the

same properties. *Titanium Metal Corp. of America v. Banner 227 USPQ 773.* Moreover, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine a satisfactory and optimum sodium content or weight.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flandrois et al 5554462 in view of Boryta et al 2004/0005267.

Regarding claims 1-5:

Flandrois et al reveal a lithium rechargeable electrochemical cell (ABSTRACT). It is disclosed that the electrolyte is constituted by an organic solvent comprising a mixture of esters and/or ethers such as dimethoxyethane (DME) and esters selected from propylene carbonate (PC) among others (COL 4, lines 1-13). The solvents has dissolved therein a lithium salt selected from lithium trifluoromethanesulfonate and lithium trifluoromethanesulfonimide, among others (COL 4, lines 1-14).

It is noted that in the absence of any electrochemical cell component/feature derived from and/or containing sodium (Na), the electrochemical cell may exhibit zero content of sodium (Na), that is to say, no sodium (Na) content at all. Thus, if both the active materials as well as suitable salts are selected from any material and/or salt except sodium (Na), the sodium (Na) content in the cell may be reduced to the claimed sodium content.

On the subject of claim 6:

Flandrois et al further discuss an example wherein each cell includes an electrolyte composed of an organic solvent with was a mixture of 20 % by volume of PC and also containing DME in which the lithium salt was dissolved at a concentration of 1 mole/liter (1.0

M) (EXAMPLE 9 or COL 10, lines 10-20). Since Flandrois et al directly disclose the use of propylene carbonate (PC) within the claimed concentration/content, as well as the teaching of constituting the electrolyte by employing a mixture of esters and/or ethers such as dimethoxyethane (DME), it is thus understood that Flandrois et al implicitly shows the claimed weight percent. In this respect, it is also noted that Flandrois clearly envisages how to prepare specific solvent mixtures by using any combination of organic solvents comprising a mixture of esters and/or ethers. Thus, Flandrois teaches the specific solvent mixture (i.e. the weight content) with sufficient specificity no matter what are the specific solvents chosen from a variety of organic solvents comprising a mixture of esters and/or ethers.

Flandrois et al discloses an electrochemical cell according to the foregoing aspects. However, Flandrois et al does not expressly disclose the specific sodium content.

Boryta et al disclose production of lithium compounds (TITLE) using integral processes for producing chemical and high purity grades of lithium materials (SECTION 0003). Boryta et al clearly divulge that it is desirable, from a commercial standpoint, to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical processes, particularly those using lithium metals (SECTION 0004); and Boryta et al further discuss about the importance of minimizing the sodium content in the metals, in particular, to manufacture low sodium lithium metal suitable for battery applications (SECTION 0020). Above all, Boryta et al disclose the production of battery grade lithium metal containing less than 100 ppm sodium (SECTION 0022 & 0082).

Examiner's note: it has been held that the term "about" allows for a magnitude (ppm weight) slightly above or below the claimed value, thus the ranges overlap. In re Woodruff 16

USPQ2d 1934 (See MPEP 2144.05 [R-1] Obviousness of Ranges). Thus, a prima facie case of obviousness exists as the claimed range overlaps a range disclosed by the prior art.

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the electrochemical cell of Flandrois et al by having the specific sodium content of Boryta et al because Boryta et al clearly disclose the importance of producing high purity battery grade lithium materials because it is desirable, from a commercial standpoint, to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical processes, particularly those using lithium metals. Namely, Boryta et al directly teach the relevance of minimizing the sodium content in the metals, in particular, to manufacture low sodium lithium metal suitable for battery applications and/or battery grade lithium metal materials.

With particular respect to the cell containing between about 100 and 1500 ppm by weight of sodium, it would have been obvious to one skilled in the art at the time the invention was made to make Flandrois et al's electrochemical cell by having the specific sodium content because Boryta et al discloses battery grade lithium metal containing less than 100 ppm sodium and it has been held that the term "about" allows for a weight slightly above or below of 100 ppm, hence, the ranges overlap. In re Woodruff 16 USPQ2d 1934 (See MPEP 2144.05 [R-1] Obviousness of Ranges). Thus, a prima facie case of obviousness exists as the claimed range overlaps the range disclosed in the prior art.

Furthermore, it would also have been obvious to a skilled artisan at the time the invention was made to make Flandrois et al's electrochemical cell by having the claimed sodium content because even though Boryta et al's sodium content does not overlap or lie inside the claimed

weight, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metal Corp. of America v. Banner 227 USPQ 773.* Moreover, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine a satisfactory and optimum sodium content or weight.

(10) Response to Argument

Appellant's arguments filed 02/06/06 have been fully considered but they are not persuasive. Additionally, the declaration under 37 CFR 1.132 of Michael Pozin originally submitted on 12/01/04 and re-submitted on 02/06/06 has been considered in its entirety.

As an initial matter, it is noted that the present claims neither claim a method of manufacturing/making the lithium electrochemical cell nor contain product-by-process limitations to further set forth any process/step recitation (i.e. a product claim that defines the claimed product in terms of the process by which it is made). Therefore, appellant's arguments that a special controlled process including certain specific techniques must be used to manufacture the cell or the explanation of the significance of the special controlled process (*See Appeal Brief at page 7-8 and the declaration under 37 CFR 1.132 of Michael Pozin dated 12/01/04 (re-submitted on 02/06/06)*) are irrelevant and ineffective to overcome the obviousness rejections presented supra. Arguments solely based upon the specific method of manufacturing the electrochemical cell are deemed not commensurate in scope with the present claims. Simply put, the fact that the lithium electrochemical cell is manufactured by performing different steps does not change the end product, i.e. the lithium electrochemical cell. The product itself does not

depend on the process of making it. In short, the patentability of a product does not depend on its method of production.

Turning next to the main contention of appellants' arguments, the assertions that the prior art of record: "*does not disclose or suggest any reason to limit the amount of sodium present in an electrochemical cell*", "*Nothing is suggested as to the sodium level of the entire electrochemical cell, as claimed*", "*Harrison discloses or suggest nothing about the sodium content of the remainder of the components of an electrochemical cell*", "*Similarly, Boryta et al identify only the need for low sodium lithium metals for battery applications, without referencing any requirement that the remainder of the electrochemical cell be low in sodium*" are respectfully disagreed with and insufficient to overcome the prima-facie case of obviousness. In this respect, the examiner points that both secondary references disclose, teach, or suggest reasons as to why the Na (sodium) content **<u>must</u>** be reduced or minimized in lithium-based chemical systems or processes. Specifically:

i) **Harrison et al** (see Abstract and paragraphs 0004-005, 0007-0008, 0015, 0020, 0029 and 0030) disclose that it was known at the time the invention was made to employ high purity lithium metal in the emerging technology of lithium batteries because high purity lithium-based components minimize lithium's rapid reactions with substances such as sodium which is considered an impurity. In particular, Harrison et al disclose the production of lithium-based components such as lithium metal being ultra-pure having maximum impurities levels of 100 ppm Na (sodium) or 190 ppm Na (sodium). Harrison et al clearly expressed that impurities such as sodium (Na) affect the purity of lithium metal, thereby they are deleterious for the operation

of electrochemical cells; and also affect the performance of the electrochemical cell or adversely affect the current efficiency of lithium cells.

ii) **Boryta et al** (refer to paragraphs 0003-0004, 0020, 0022 and 0082) suggest that those of ordinary skill in the art at the time the invention was made knew that it is desirable to provide a source of lithium low in sodium content because sodium becomes reactive and potentially explosive in certain chemical environments, especially those using lithium metals. In essence, Boryta et al suggest that it was known to manufacture low sodium lithium metal suitable for battery applications, specifically, battery grade lithium metal containing less than 100 ppm sodium.

Hence, it is clear from the teachings above that both secondary references evidently disclose that reduction, removal and/or elimination (high purity) of Na is necessary to minimize lithium's rapid reaction with such substance or simply because Na is highly reactive and potentially explosive. Thus, both secondary references offer the skilled artisan enough motivation to remove from or minimize sodium content in lithium-based systems as a whole.

It is believed that the teachings of the two secondary references to reduce or minimize the sodium content in lithium-based systems to avoid an explosion or reduce lithium's rapid reaction with sodium is suggestive enough to understand that sodium (Na) is an unwanted impurity in lithium-based systems (as a whole) such as lithium electrochemical cells. Not because the secondary references suggest reducing sodium content in only one specific component containing lithium to avoid an explosion or undesirable reactivity, it means that the rest of a lithium-based system such as the claimed lithium electrochemical cell can contain unwanted

levels of sodium. It cannot be ignored that the prior art of record emphatically suggests reducing the content of sodium (Na) in lithium applications per se.

The fact that is known in the prior art that sodium (Na) produces unwanted and detrimental reactions when combined with lithium is sufficient to state or recognize that an entire lithium-based system such as the claimed lithium electrochemical cell (as a whole) must necessarily contain reduced or minimal amounts of sodium (Na) within the claimed range; otherwise deleterious effects including catastrophic explosions or unwanted reactivity will occur therein.

Furthermore, since the present claims are directed to a lithium electrochemical cell per se, the examiner strenuously contends that both secondary references (i.e. Harrison et al'871 and Boryta et al'267) are analogous art and thus, pertinent to the primary references and the field of appellant's endeavor because they specifically suggest how to reduce unwanted reactivity and avoid explosion in lithium-based system or devices designed to employ lithium as a main component. In other words, the secondary references clearly disclose that it is highly recommended to reduce the concentration of sodium in lithium-based systems due to its reactivity. If appellants do not believe, from a chemical standpoint, that minimizing lithium's rapid reactions and/or avoiding potential explosions in lithium systems by lowering sodium content is a reasonable motivation to minimize or reduce sodium concentration or contents, thus, the examiner respectfully submit that appellants do not understand and completely overlook safety requirements and the desirability of providing a safe and chemically stable lithium-based system which minimizes any potential risk or harm to customers using it. For this reason, the examiner maintains herein his position that the secondary references provide a reasonable

motivation to modify the primary references to reduce or lower the sodium content in the lithium environment of the disclosed electrochemical cells.

All in all, the examiner strongly disagrees with the position taken by the appellant that the secondary references do not expressly disclose reducing sodium content in electrochemical cells per se, as their teachings are somehow only applicable "in the context of the preparation of specific components (e.g. cathode or lithium metals)" but not in the context of preparing the electrochemical cell as a whole. Don't you think that those of ordinary skill in the art attempting to provide a fully functional lithium electrochemical cell would carefully look at the teachings of both Harrison et al'871 and Boryta et al'267 and would definitely consider their teachings about lithium reactivity and sodium content in an attempt to prevent unnecessary reactivity and/or dangerous explosion? Thus, the examiner reiterates his position that the teachings of Harrison et al'871 and Boryta et al'267 cannot be only segregated to specific components or elements, in fact, such teachings are totally extendable to any lithium-based system or any system/product using lithium as a primarily essential feature as instantly claimed (i.e. the lithium electrochemical cell).

Additionally, in response to appellant's argument that "none of the references disclose or suggest any reason to limit the amount of sodium present in an electrochemical cell", the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art (←emphasis added). See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In further response to appellant's argument that "none of the cited primary references recognize that the sodium content of a cell is either important or affects the performance of the cell", the fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). However, this appellants' argument contradicts appellant intended invention of reducing the amount of sodium in an electrochemical cell. That is, this argument is irrelevant to the claimed subject matter because, as appellant is aware of, his ultimate intended invention is to reduce the sodium content in the electrochemical cell; in no way, appellant's invention is intended to add, aggregate or incorporate sodium in the electrochemical cell. Thus, appellant's arguments that the prior art of record must thus recognize the importance of using sodium is completely inapposite and out of place.

Appellant has argued that "there is no indication in the primary references that the cell should be manufactured and/or handled in a certain way to provide the claimed sodium content". Nevertheless, appellant is respectfully reminded that his ultimate intended invention is a lithium electrochemical cell per se, and not its method of manufacture or production. Thus, appellant's arguments concerning the lack of specific production/manufacturing steps add nothing to the patentability of the claimed product (i.e. the electrochemical cell) because what is given patentably consideration is the product itself and not the manner in which the product was made.

Regarding appellant's argument that "there is also no indication in any of the primary references of where the cell components were purchased or whether they were provided to have a low sodium content", since PTO does not have proper equipment to carry out such analytical

tests and/or does not require appellants to provide such information about raw material sources or suppliers, the burden is shifted to the appellants to provide sound or objective evidence demonstrating that the primary references were/are originally intended to employ cell components having a higher lithium content.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Raymond Alejandro
Primary Examiner
Art Unit 1745

Conferees:
Pat Ryan PR
Steve Griffin